

What is claimed is:

1. A gastroelectric stimulator for treating pancreatic exocrine conditions in a patient, comprising:
  - a neurostimulator for producing a stimulation signal;
  - at least one electrical lead having a proximal end and a distal end, the proximal end being connected to the neurostimulator and the distal end positionable in a lead position within the patient's abdomen; and,
  - at least two electrodes carried near the electrical lead distal end, the electrodes being electrically connected through the electrical lead to the neurostimulator to receive the stimulation signal and convey this signal to an electrode position within the patient's digestive system,wherein the stimulation signal is adapted to influence pancreatic exocrine output.
2. The gastroelectric stimulator as in claim 1 wherein the electrode position is selected from the group consisting of: stomach, pancreas, vagus nerve, and intestine.
3. The gastroelectric stimulator as in claim 1 wherein the stimulation signal frequency is in the range from about 3.0 pulses per minute to 18,000 pulses per minute.
4. The gastroelectric stimulator as in claim 1 wherein the stimulation signal pulse width is in the range from about 0.01 mSec to 500 mSec.
5. The gastroelectric stimulator as in claim 1 wherein the stimulation signal has a peak amplitude in the range from about 0.01mA to 100.0 mA.
6. The gastroelectric stimulator as in claim 1 wherein the stimulation signal substantially influences afferent nerves.

7. The gastroelectric stimulator as in claim 1 wherein the stimulation signal substantially influences efferent nerves.
8. The gastroelectric stimulator as in claim 1 wherein the stimulation signal comprises at least a first stimulation signal and at least a second stimulation signal.
9. The gastroelectric stimulator as in claim 8 wherein the second stimulation signal is a null signal.
10. The gastroelectric stimulator as in claim 8 wherein the first stimulation signal and the second stimulation signal are sequenced to create at least a first therapy.
11. The gastroelectric stimulator as in claim 1, further comprising a sensor electrically connected to the neurostimulator, the sensor generating a sensor signal indicative of a patient condition wherein the neurostimulator receives the sensor signal and controls the stimulation signal in response to the sensor signal.
12. A gastroelectric stimulator for treating pancreatic exocrine conditions in a patient, comprising:
  - a neurostimulator for producing a stimulation signal;
  - at least one electrical lead having a proximal end and a distal end, the proximal end being connected to the neurostimulator and the distal end positionable in a lead position within the patient's abdomen;
  - at least two electrodes carried near the electrical lead distal end, the electrodes being electrically connected through the electrical lead to the neurostimulator to receive the stimulation signal and convey this signal to an electrode position within the patient's digestive system; and,
  - means for influencing pancreatic exocrine output using the stimulation signal.

13. A method for treating pancreatic exocrine conditions in a patient, comprising:  
applying at least two electrodes to a digestive system of the patient that are coupled by at least one lead to a neurostimulator;  
stimulating the digestive system with a stimulation signal generated by the neurostimulator and conveyed through the lead to the electrodes contacting the digestive system;  
transmitting the digestive system stimulation to a pancreas of the patient; and,  
influencing pancreatic exocrine secretion when the patient's pancreas responds to digestive system stimulation.
14. The method for treating pancreatic exocrine conditions as in claim 13, further comprising measuring a patient condition and controlling the stimulation signal in response to the measured patient condition.
15. The method of treating pancreatic exocrine conditions as in claim 14 wherein measuring the patient condition is accomplished with a sensor electrically connected to a neurostimulator.
16. The method a treating pancreatic exocrine conditions as in claim 15 wherein measuring the patient condition is accomplished by a person.
17. A gastroelectric stimulator for increasing pancreatic exocrine secretions in a patient, comprising:  
a neurostimulator for producing a stimulation signal;  
at least one electrical lead having a proximal end and a distal end, the proximal end being connected to the neurostimulator and the distal end positionable in a lead position within the patient's abdomen;

at least two electrodes carried near the electrical lead distal end, the electrodes being electrically connected through the electrical lead to the neuroelectrical stimulator to receive the stimulation signal and convey this signal to an electrode position within the patient's digestive system; wherein the stimulation signal is adapted to increase pancreatic exocrine output.

18. The gastroelectric stimulator as in claim 17 wherein the stimulation signal has a frequency in the range from about 3.0 pulses per minute to 6,000 pulses per minute.

19. The gastroelectric stimulator as in claim 17 wherein the stimulation signal creates an antiemetic effect.

20. The gastroelectric stimulator as in claim 17 wherein the increased exocrine output calms vomiting sensors in the duodenum.

21. The gastroelectric stimulator as in claim 17 wherein the stimulation signal stimulates vagal efferent nerves to increase pancreatic exocrine secretion.

22. The gastroelectric stimulator as in claim 17 wherein the stimulation signal stimulates vagal afferent nerves to increase pancreatic exocrine secretion.

23. The gastroelectric stimulator as in claim 17 wherein increased pancreatic exocrine secretion reduces the hypertonicity of duodenal chyme that causes a decreases in stimulation of duodenal osmo-receptors that results in an antiemetic effect.

24. The gastroelectric stimulator as in claim 17 wherein the increased pancreatic exocrine secretion reduces gastric dysrhythmias.

25. A gastroelectric stimulator for increasing pancreatic exocrine secretions in a patient, comprising:

a neurostimulator for producing a stimulation signal;

at least one electrical lead having a proximal end and a distal end, the proximal end being connected to the neuroelectrical stimulator and the distal end positionable in a lead position within the patient's abdomen;

at least two electrodes carried near the electrical lead distal end, the electrodes being electrically connected through the electrical lead to the neurostimulator to receive the stimulation signal and convey this signal to an electrode position within the patient's digestive system; and,

means for influencing pancreatic exocrine output using the stimulation signal.

26. A method for increasing pancreatic exocrine secretions in a patient, comprising:  
applying at least two electrodes to a digestive system of the patient that are coupled by at least one lead to a neurostimulator;

stimulating the digestive system with a stimulation signal generated by the neurostimulator and conveyed through the lead to the electrodes contacting the digestive system; and,

transmitting the digestive system stimulation to a pancreas of the patient; and,

increasing pancreatic exocrine secretions when the pancreas responds to digestive system stimulation.

27. A gastroelectric stimulator for decreasing pancreatic exocrine secretions in a patient, comprising:

a neurostimulator for producing a stimulation signal;

at least one electrical lead having a proximal end and a distal end, the proximal end being connected to the neurostimulator and the distal end positionable in a lead position within the patient's abdomen;

at least two electrodes carried near the electrical lead distal end, the electrodes being electrically connected through the electrical lead to the neurostimulator to receive the stimulation signal and conveying this signal to an electrode position within the patient's digestive system;

wherein the stimulation signal is adapted to decrease pancreatic exocrine output.

28. The gastroelectric stimulator as in claim 27 wherein the stimulation signal has a frequency of greater than 6,000 pulses per minute.

29. A gastroelectric stimulator for decreasing pancreatic exocrine secretions in a patient, comprising:

a neurostimulator for producing a stimulation signal;

at least one electrical lead having a proximal end and a distal end, the proximal end being connected to the neurostimulator and the distal end positionable in a lead position within the patient's abdomen;

at least two electrodes carried near the electrical lead distal end, the electrodes being electrically connected through the electrical lead to the neurostimulator to receive the stimulation signal and convey this signal to an electrode position within the patient's digestive system; and,

means for decreasing pancreatic exocrine output using the stimulation signal.

30. A method for decreasing pancreatic exocrine secretions in a patient, comprising:

applying at least two electrodes to a digestive system of the patient that are coupled by at least one lead to a neurostimulator;

stimulating the digestive system with a stimulation signal generated by the neurostimulator and conveyed through the lead to the electrodes contacting the digestive system; and, transmitting the digestive system stimulation to a pancreas of the patient; and, decreasing pancreatic exocrine secretions when the pancreas responds to digestive system stimulation.

31. A gastroelectric stimulator for treating pancreatic endocrine conditions in a patient, comprising:

a neurostimulator for producing a stimulation signal;

at least one electrical lead having a proximal end and a distal end, the proximal end being connected to the neurostimulator and the distal end positionable in a lead position within the patient's abdomen; and,

a least two electrodes carried near the electrical lead distal end, the electrodes being electrically connected through the electrical lead to the neurostimulator to receive the stimulation signal and convey this signal to an electrode position to contact the patient's stomach,

wherein the stimulation signal is adapted to influence pancreatic endocrine output.

32. The gastroelectric stimulator as in claim 31 wherein the electrode position on the patient's stomach is a stomach pacemaker region.

33. The gastroelectric stimulator as in claim 31 wherein the stimulation signal influences afferent nerves.

34. The gastroelectric stimulator as in claim 31 wherein the stimulation signal influences efferent nerves.

35. The gastroelectric stimulator as in claim 31 wherein the stimulation signal has a frequency of about 3.0 pulses per minute to 18,000 pulses per minute.

36. The gastroelectric stimulator as in claim 31 wherein the stimulation signal is a program therapy signal selected from the group consisting of: diabetes and pancreatitis.

37. A gastroelectric stimulator for influencing pancreatic endocrine secretions in a patient, comprising:

a neurostimulator for producing a stimulation signal;

at least one electrical lead having a proximal end and a distal end, the proximal end being connected to the neurostimulator and the distal end positionable in a lead position within the patient's abdomen;

at least two electrodes carried near the electrical lead distal end, the electrodes being electrically connected through the electrical lead to the neurostimulator to receive the stimulation signal and convey this signal to an electrode position contacting the patient's stomach; and,

means for influencing pancreatic endocrine output using the stimulation signal.

38. A method for increasing pancreatic exocrine secretions in a patient, comprising:

applying at least two electrodes to a digestive system of the patient that are coupled by at least one lead to a neurostimulator;

stimulating the digestive system with a stimulation signal generated by the

neurostimulator and conveyed through the lead to the electrodes contacting a stomach of the patient;

transmitting the stimulation signal from the stomach to a pancreas; and,



influencing pancreatic endocrine secretions when the pancreas responds to stomach stimulation.

39. A gastroelectric stimulator therapy for treating duodenal osmotic imbalance in a patient, comprising:

a neurostimulator for producing a stimulation signal;

at least one electrical lead having a proximal end and a distal end, the proximal end being connected to the neurostimulator and the distal end positionable in a lead position within the patient's abdomen; and,

at least two electrodes carried near the electrical lead distal end, the electrodes being electrically connected through the electrical lead to the neurostimulator to receive the stimulation signal and convey this signal to an electrode position within the patient's digestive system,

wherein the stimulation signal is adapted to increase pancreatic secretions.

40. The gastroelectric stimulator as in claim 39 wherein pancreatic secretions reduce symptoms of nausea and vomiting by reducing the hypertonicity of duodenal chyme.

41. The gastroelectric stimulator as in claim 39 wherein the patient suffers from a condition selected from the group consisting of: morning sickness and cancer chemotherapy.

42. A method for treating duodenal osmotic imbalance in a patient, comprising:

applying at least two electrodes to a digestive system of the patient that are coupled by at least one lead to a neurostimulator;

stimulating the digestive system with a stimulation signal generated by the

neurostimulator and conveyed through the lead to the electrodes contacting the digestive system;

transmitting the digestive system stimulation to a pancreas of the patient; and,  
increasing pancreatic secretion when the patient's pancreas responds to digestive system  
stimulation to reduce duodenal osmotic imbalance.

43. The method of treating duodenal osmotic imbalance as in claim 42 wherein duodenal osmotic imbalance is reduced by decreasing hypertonicity of duodenal chyme.